

From: [MCCLINCY Matt](#)
To: [Eric Blischke/R10/USEPA/US@EPA](#); [Chip Humphrey/R10/USEPA/US@EPA](#)
Cc: [ANDERSON Jim M](#); [Rene Fuentes/R10/USEPA/US@EPA](#); [Kristine Koch/R10/USEPA/US@EPA](#)
Subject: RE: FW: TZW report DEQ PM Feedback
Date: 03/20/2007 02:51 PM

Eric and Chip,

I asked DEQ project managers (PMs) to provide feedback on the = transition zone groundwater (TZW) data generated by the LWG on the projects that we = had not provided early feedback [Gunderson, Willbridge and Kinder Morgan = (Former GATX)] as well as any significant updates on the other potential TZW = sites that we have been tracking. Some of the responses are more detailed = than others. Additional TZW data is suggested by PMs for RPAC, Willbridge and = Gunderson Area 1 and initial TZW data at Premier Edible Oils. Additional TZW data = at RPAC, Willbridge and Gunderson would be to provide a more complete = characterization of the off-shore TZW. DEQ appreciates that EPA and the government = team is still sorting out where to make the break concerning how much data is = necessary to characterize individual iAOPCs for the RI/FS versus what can be = deferred to RD/RA. Please let me know if you have any questions.

RPAC

I previously forwarded project manager feedback on the RPAC = site. In general, DEQ believes that there is adequate TZW do conduct a risk assessment. However, the vertical and lateral extent of the = groundwater plume is much larger than depicted by RPAC or the LWG in the recent = Round 2 Report. The RPAC plume was one of the plumes that had been = identified for additional off-shore characterization possibly by the individual RP to = identify and characterize the deeper groundwater plume discharge areas (ala = Gasco). RPAC has not proposed any additional off-shore characterization. = They appear focused on the interpretation that the initial LWG TZW data is representative of the deeper plume. This may or may not be the case. DEQ has tentative agreement from NW Natural to include RPAC constituents including some dioxin sampling, during their Phase 2 = off-shore work that will occur this summer. However, the current scope of = the additional Gasco off-shore work would only pick up the northern portion = of the potential RPAC plume. Additional off-shore TZW investigation is = recommended to characterize the TZW related to the deeper groundwater = plume.

Willbridge from Henning = Larsen

1. Is the area of apparent groundwater discharge and = transition zone

groundwater (TZW) data consistent with the upland conceptual =
hydrogeologic model?

Yes. = Hydraulically, groundwater gradients have been historically to the E-NE = (oblique to the river, somewhat upstream). The RI indicates the = explanation for this gradient is that the Holbrook Slough and a large stormwater line = located in the southeast portion of the site, are acting as preferential = pathways for groundwater flow. The TMZ work to quantify seepage rates in river sediments identified the = highest groundwater discharge rates in the SE area of the site and in close = proximity to the historical location of the slough. **So, groundwater gradients and inferred = upland flow directions match up with the primary GW discharge areas in the river = identified by the LWG.**

Contaminant = levels in upland areas and in the transition zone water match up pretty well, = at least relatively speaking. Concentrations are much lower in the TMZ than in upland areas, but highs in riverfront = wells and upland areas match up pretty well with maximums detected = in the = TMZ.

= ;

2. Do you think additional sampling is necessary to obtain representative TZW data to conduct a TZW risk assessment representative = of the groundwater pathway from upland sources?

Yes.

3. Is the characterization of TZW adequate or are there = data gaps (e.g., nature and extent)? If so please elaborate and propose = recommended sampling points/strategies.

There is no TMZ = data off-shore from one of the main source areas located on the Kinder Morgan facility. In addition, the highest seepage area only had a single = sample to characterize TMZ concentrations in the SE portion of the site = (Conoco-Philips). I would propose another 6-10 sampling locations to cover data gaps and to = compare to earlier results.

4. Did the TZW data contain any surprises which will = result in additional upland groundwater characterization?

No. =

= ; =

5. Do you agree/disagree with the LWG = assessment/conclusions relative to TZW adjacent to your site?

I generally = agree with their conclusions. Upland GW and TMZ data match up pretty well. PAH levels in sediments decrease with depth suggesting groundwater may not be the primary transport media for = these contaminants.

Kinder Morgan (Former GATX) = Info from Mike Romero

1. Is the area of apparent groundwater discharge and = transition zone

groundwater (TZW) data consistent with the upland conceptual =

hydrogeologic model? *Yes. Including labeled = upland GW monitoring wells on a plan view figure would have been helpful when = comparing GW data to the TZW.*

= ;

2. Do you think additional sampling is necessary to obtain representative TZW data to conduct a TZW risk assessment representative = of the groundwater pathway from upland sources? *= I don't think = so. The areas they focused on makes sense based on the upland = site data, known lithology and the other factors in the hydrogeologic = CSM. I agree with the offshore area of mixed sand and silt and = directly down = gradient of the measured seepage area and the highest concentration of = NAPL for a deeper (150 cm) sample.*

3. Is the characterization of TZW adequate or are there = data gaps (e.g., nature and extent)? If so please elaborate and propose = recommended sampling points/strategies. *I think their = characterization is accurate based on the available site information. We still = have a few nature and extent data gaps in the upland for the extent = of NAPL to the north of MW-3 and south of MW-25 but it is unlikely that = this will effect TZW because of the clay lithology in the bank and sediment = just offshore which is why I think they didn't select this area for TZW sampling. We also need to determine the vertical extent = of the dissolved plume in the area of the IRAM system for a complete capture = zone analysis. Don't think it will effect the TZW CSM they have = presented here b/c they have already sampled the areas with highest potential for TZW = impact.*

4. Did the TZW data contain any surprises which will result in additional upland groundwater characterization? *No, but I was surprised at the overall lack of impact to TZW. This data has also sparked my interest in the general GW ion chemistry in upland GW and will consider the idea of collecting that data further.*

= ; =

5. Do you agree/disagree with the LWG assessment/conclusions relative to TZW adjacent to your site? *I agree based on what they presented and what we currently know about the site.*

Gunderson Info from Dana Bayuk

This e-mail provides the information requested in your February 22, 2007 e-mail (see below). In preparing the e-mail I've relied on information provided in Section 12.0 (Gunderson Area 1) of the "DRAFT - Portland Harbor RI/FS, Round 2 Groundwater Pathway Assessment, Transition Zone Water Site Characterization Summary Report" dated August 7, 2007 (TZW summary report). I have tried to provide enough information to answer the questions fully without delving too deeply into the details of the data.

Consistent with my understanding of the February 22nd e-mail, my response to Item #1 is limited to discussions of transition zone water (TZW) sampling conducted offshore of Area 1 of the Gunderson site. The five questions included under Item #1 have been designated items 1a through 1e in this e-mail. Information and/or recommendations regarding Area 2 and Area 3 of the facility are provided under Item #2.

= **1a.** Based on a limited dataset (see Footnote 1), the results of the TZW sampling appear to be consistent with the working hydrogeologic CSM (HCSM) developed for Area 1 of the Gunderson site.

The principal COI for groundwater in Area 1 are VOCs associated with an upland release from a former solvent dip tank (primarily 1,1,1-trichloroethane [1,1,1-TCA] and its breakdown products). A plume of VOC impacted groundwater has been identified extending 500-600 feet downgradient from the former dip tank to the river. The locations of groundwater discharge measuring stations and TZW sampling sites were selected by projecting the upland VOC plume offshore.

The current HCSM interprets groundwater contaminated by VOCs to be migrating from the source area to/under the river via two stratigraphic units (i.e., Sand/Silt Unit and underlying the Gravel Unit which consists of the Detrital Gravel and/or Angular Weathered Basalt Gravel geologic units [see figures 12-5b through 12-5e]). The sand/silt and gravel units project beneath finer grained sediments consisting of mixtures of silt with clay and sand under the river. In November 2004, Gunderson began operating a single extraction well intended to intercept the VOC plume up gradient of the river. The well is expected to have minimal

influence on = the portion of the plume already under the river.

Under the = working HCSM described above, VOC concentrations would be expected to increase with = depth below mudline (bml). The data collected at sampling locations GN04A and = GN05A supports this scenario. Based on seepage meter and Trident Probe = measurements, sampling locations GN04A and GN05A are interpreted to occur in a “groundwater discharge zone” (GDZ). Comparison of the data = from these two locations indicates the highest concentrations of VOCs were = detected at GN05A, the sampling location where deeper sediments were collected = for analysis (see Footnote 2).

Footnote 1. Only one other TZW sample = (GN01E) was collected for analysis from a depth bml greater than 38 cm. Except for = GN04A and GN05A, VOCs associated with Gunderson uplands release(s) were not = detected at other TZW sampling locations.

Footnote 2. = As shown in Figure 12-4 (Plan View of Select Analytical TZW Data - Gunderson), = the total VOC concentrations detected in the deepest TZW sample collected at GN04A = and GN05A were 21 ug/L (GN04A from 90 cm bml) and 474 ug/L (GN05A from = 150 cm bml). At GN05A the mudline elevation was approximately 2 feet = lower (i.e., sampling was initiated ~60 cm lower stratigraphically) than = GN04A, and the lower-most sediment sample was collected from 150 cm bml at GN05A = compared to 90 cm bml at GN04A.

1b. DEQ recommends collecting additional TZW samples offshore = of Area 1 as follows:

- **A sample located approximately 775 feet south along the “Section A-A’ TZW Profile” (see Figure 12-6a). This sample location = corresponds with a lowest point in the river bottom along section = A-A’.**
- **Three TZW = samples should be collected at the approximate locations of GNSEEP3B, GN04-B, and = G441.**

Samples of TZW = at all locations should be collected for analysis at depths of approximately 38 = cm and 150 cm and analyzed for VOCs.

1c. The sampling = completed by the LWG has determined that VOCs associated with releases in the Gunderson = uplands are present in TZW in the interpreted GDZ. Certain VOCs (e.g., = tetrachloroethene [PCE], 1,1-dichloroethene [1,1-DCE], 1,1,1-TCA) exceed relevant screening = criteria. DEQ considers data gaps to exist with regard to: 1) the areal extent of = GDZ offshore of the site; and 2) the representativeness of the TZW VOC data. =

Collecting the samples recommended under Item 1b will provide data to = further assess the lateral extent and vertical trends of VOC concentrations = within the GDZ. Given its location and the working HCSM, DEQ considers the sample = proposed for collection along profile A-A’ from 150 cm to be the most useful. = This sample represents the deepest TZW sample collected offshore of Area 1 in = the GDZ and would provide data to compare to GN05A. The results of analyzing = this sample could also provide a more representative “worst-case” dataset for loading estimates

and the risk assessment.

1d. Detections of PCE in = TZW have prompted a general review of the uplands groundwater data for detections = of this chemical and/or its breakdown products.

1e. Comments to Section = 12.0 of the TZW summary report are provided below.

Section 12.3.1 = of the TZW summary report indicates that, "TZW concentrations of three metals – arsenic, barium, and manganese – consistently exceed = either the draft ecological chronic or minimum human health screening = values..." DEQ notes that Figure 12-3a indicates the detected concentrations of = cadmium, copper, and lead in certain TZW samples also exceed ecological screening values. Comparison of figures 12-3a and 12-9a suggests that exceedances = of cadmium, copper, and lead primarily occur in the "Low-to-No = Groundwater Discharge Zone." The text of the section should be reviewed and = revised accordingly.

According to Section 12.3.3 of the report, data supports, = "...the conceptual understanding that the remediation extraction wells have = intercepted the upland plume, and that concentrations observed in TZW represent a = riverward remnant of the pre-remediation extent of the plume." Although DEQ = agrees that the extraction well is intercepting contaminated groundwater, the = degree to which the plume is being intercepted has not been determined. = As such, it is premature to conclude that the extraction has "intercepted = the upland plume." The text of this section should be revised accordingly. Evaluation of the effectiveness of the current = extraction system is ongoing and will not be formally reviewed until later this = year.

Monitoring well = MW-52 and GN05A should be added to figures 12-5b and 12-5c for completeness and comparison purposes. Regarding GN05A, adding the TZW data from this = location to cross-section A-A' would provide a more complete visual = perspective on the vertical distribution of VOCs in the GDZ. Monitoring well MW-52 is = located approximately equidistance east from A-A' as monitoring well MW-51 is = west. Additionally, both wells are: 1) downgradient of the extraction = well, and 2) approximately the same distance from the river. Monitoring well = MW-51 is included on figures 12-5b through 12-5e. The data included in these = figures is taken from the February 2005 groundwater sampling event. As shown on = the four referenced figures the detected concentrations of 1,1-DCE and = 1,1,1-TCA at MW-51 were 2.8 micrograms per liter (ug/L) and 6.0 ug/L respectively. = For comparison the detected concentrations of 1,1-DCE and 1,1,1-TCA at MW-52 = were 180 ug/L and 88 ug/L.

As noted above, monitoring well MW-51 is included in the stratigraphic cross-sections = shown in figures 12-5b through 12-5e. The geology shown at MW-51 on figures 12-5b = and 12-5c does not match figures 12-5d and 12-5e. These figures should be = generally reviewed and revised accordingly.

An additional stratigraphic cross-section should be prepared to = graphically illustrate the relationships between geologic units and VOCs in = groundwater and TZW along a transect oriented parallel to the shoreline. This = cross-section(s) would provide needed perspective on the nature and extent of VOCs near = and along the river.

= 2. DEQ is no longer recommending that TZW samples be collected offshore of Area 3 of the Gunderson facility. Note that although = DEQ is not recommending TZW sampling, we will be expecting Gunderson to perform additional work in the uplands to further evaluate the groundwater = pathway in support of the Area 3 RI and source control evaluation (e.g., further = evaluate metals concentrations).

DEQ's rational = for not conduct TZW sampling along Area 3 is summarized below.

- Since the = recommendation for TZW sampling was made, Gunderson has installed and/or sampled seven = shallow groundwater monitoring wells along the Area 3 shoreline. Five of = the monitoring wells are within 125 feet of the river, and the remainder are = within approximately 175 feet. Each of the wells has been sampled and analyzed = at least four times for diesel-range (DRPH) and oil-range petroleum = hydrocarbons (ORPH), PCBs, PAHs, VOCs, and metals. In addition, samples have been analyzed at = least once to screen shallow groundwater for the presence of phthalates and = butyl tins.

- Except for DRPH, = ORPH, and certain metals, COI were either: 1) not detected at or above = the laboratory method reporting limit (PCBs, VOCs, butyl tins); 2) detected = at concentrations less than screening criteria (selected PAHs and metals), = or 3) inconsistently detected at low concentrations (low parts per billion) at = a single location (bis-2-ethylhexyl-phthalate). Note that this = comment does not consider cases where the MRL is greater than screening = criteria.

- The maximum = detected concentrations of DRPH and ORPH in shallow groundwater near the = shoreline were 3.33 milligrams per liter (mg/L) and 3.54 mg/L = respectively.

Total = concentrations of certain metals (e.g., arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, and zinc) detected in shallow groundwater consistently exceeded screening criteria near the Area 3 = shoreline. However, the detected concentrations of metals in sediment offshore of = Area 3 are orders of magnitude greater and extend to depths greater than 150 cm = (i.e., the lower depth of TZW sample collection). As such, DEQ concludes = that the potential for sediment to overwhelm metals concentrations associated = with uplands groundwater is high (i.e., groundwater contributions to = porewater concentrations could not be determined).

In addition to work completed in Area 3, Gunderson collected samples = from existing monitoring wells in Area 2 to assess shallow groundwater as a contaminant transport pathway in this portion of the site. Shallow

groundwater samples were collected at least three times for a suite of analyses similar to Area 3. In general the conclusions DEQ reached from reviewing shallow groundwater data for Area 3 are applicable to the northern half of Area 2. DEQ is not recommending TZW sampling along the Area 2 shoreline at this time.

McCall Oil: As previously noted, DEQ, based on a weight-of-evidence evaluation, does not feel that source control for groundwater or off-shore TZW work is warranted. This position has not been formally vetted with EPA because DEQ has been waiting to complete the stormwater screening. However, based on recent comments from Kristine on an unsolicited source control evaluation document that McCall provided to EPA, EPA appears to have greater concerns about the groundwater at the McCall site than DEQ. TZW data off of the McCall Oil site could potentially resolve source control concerns. However, given the presence of TPH and PAH contamination in sediments which may be the result of nearby outfall discharges or Willbridge activities, it will be difficult to ascribe TZW contaminants detected to groundwater migrating from the McCall Oil site.

Portland Shipyard: Low level groundwater impacts are present at the site. As (up to 16 ppb), vinyl chloride (up to 6 ppb), trichloroethylene (up to 15 ppb); and other metals and PAHs historically exceeded JSCS screening levels. However, metals concentrations appear to be consistent with natural background levels and concentrations of other contaminants appear to be declining. As a result, DEQ continues to *not* recommend TZW sampling at this site.

Premier Edible Oils: Former bulk fuel facility and other industrial uses. Groundwater contamination includes petroleum hydrocarbons and chlorinated solvents. NAPL is present. Preferential migration pathways may include storm drains but this is unconfirmed. Groundwater characterization is considered incomplete. More information on nature and extent of groundwater contamination is required. LPAHs detected in off shore sediments at concentrations up to 3.9 mg/kg; HPAHs up to 8.1 mg/kg. PEO failed to perform upland groundwater work during 2005/2006.

- **Recommendation: TZW = investigation recommended off-shore of southern portion of site.**

<= /font>

Mike Romero - = I agree that TZW sampling should be conducted off south shore, rip-rap and steep = bank at mouth of slip could be problematic. PEO has proposed an = additional upland riverward well but it may not provide enough information to full characterize TZW.

MarCom: Upland = groundwater investigations in the southern parcel have detected low levels of TCE = (10 – 15 ppb). However, no monitoring wells have been installed adjacent to the river. Additional groundwater investigations are proposed. If the additional groundwater work demonstrates a = complete pathway to the river, TZW sampling may be warranted in 2007.

Mike Romero - = One additional MW was installed near river in boat way last fall. = Results indicate no VOC or other COIs of significance detected I that = area. Two additional wells in knoll area top of bank south of boat way were = installed in late February 2007, sampling results are pending. I = don't expect TZW to be needed based on upland GW info so far, although north = parcel beach area still needs to be investigated. Sediment impacts = from boat way runoff and historic over water activities pose the biggest = potential environmental impact

UPRR: Groundwater = impacts are known at the site. However, there is no evidence that groundwater contamination is reaching the Willamette River. Additional = groundwater investigations are proposed. If the additional groundwater work demonstrates a complete pathway to the river, TZW sampling may be = warranted in 2007.

Mike Romero - = Much of the monitor well network was replaced in fall of 2006 b/c focused water = level study determined well to be cross-connecting two separate hydrologic units. New wells throughout site were also installed for general = nature and extent purposes. Summary report is currently due but it is = unlikely that TZW is a high priority at this site based on previous = knowledge.

GS Roofing: = Groundwater impacts are present at the site. However, there is no evidence = that groundwater contamination is reaching the Willamette River. = Additional groundwater investigations are proposed. If the additional = groundwater work demonstrates a complete pathway to the river, TZW sampling may be warranted in 2007. *Mike Romero - Agree. Timing may be a factor = and TZW, if needed, may need to be performed by RP.*

Schnitzer – Head of International = Slip: Groundwater = investigation adjacent to the head of the slip itself has been limited. Investigations = have focused on potential source areas further up gradient. At this = time, there is no reason to believe that groundwater at the head of the slip = is significantly impacted. However, if **additional site characterization efforts demonstrate a complete pathway to the river, = TZW sampling may be warranted in 2007.** *Mike Romero - Agree. No = groundwater work at head of slip has been conducted to date. Seeps have been = observed at lithologic contact in the bank and are consistent enough to produced mini-wetland environment during dry months Schnitzer is currently = working on workplan to address the groundwater in this area. Timing may be issue and = TZW may be responsibility of RP.*

There is no new information that changes DEQ's perspective = for the Foss/Brix, Marine Finance, OSM, Willamette Cove, NW Pipe or Sulzer = Pump.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXX=
XXX

-----Original Message-----

From: Blischke.Eric@epamail.epa.gov =
[mailto:Blischke.Eric@epamail.epa.gov]
Sent: Wednesday, February 21, 2007 1:39 PM
To: MCCLINCY Matt
Cc: humphrey.chip@epa.gov
Subject: Re: FW: TZW report DEQ PM Feedback

Matt, you have provided information on the following = sites:

Arco, Exxon Mobil and Rhone Poulenc.

We discussed that GASCO, Arkema and Siltronic are moving down = a different pathway where the upland party is taking = responsibility (we will note of course in our comments that our determination that = no additional work at these sites is contingent on progress by the = upland

parties).

That leaves the following sites:

Willbridge - you will talk to Henning

Gunderson - you spoke to Dana and he will get to next = week.

Kinder Morgan (former GATX) - still need to = follow-up.

I am also attaching the new site summary from last summer. = It would be

good to get an update on the potential for work at new sites = such as OSM, PEO, Willamette Cove and Gunderson Area 3 as well as any = new information about the other sites listed in this = document.

Thanks, Eric

(See attached file: New Groundwater Pathway Evaluation = Sites.doc)

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Eric, Chip, Rene and Kristine,

Attached below is feedback from the DEQ PM/teams on the LWG TZW =
data for

the Arco, ExxonMobil and SLLI (Rhone Poulenc sites. Our = review is not
comprehensive, but given everyone's work load it is what I = have right
now. The PMs answered a number of questions relative to = the TZW
data.

Let me know if you have any questions.

Matt

Matt-

I reviewed the 8/7/06 LWG TZW report's sections on Arco and ExxonMobil and have the following responses to your queries.

Arco

= ; 1. Is the area of apparent groundwater = discharge
= ; and transition zone groundwater (TZW) data consistent
= ; with the upland conceptual hydrogeologic model?
= ; = Yes.
= ; 2. Do you think additional sampling is = necessary
= ; to obtain representative TZW data to conduct a TZW
= ; risk assessment representative of the groundwater
= ; pathway from upland sources?
= ; = No.
= ; 3. Is the characterization of TZW adequate = or are
= ; the data gaps (e.g., nature and extent)? If so = please
= &= nbsp; elaborate and propose recommended sampling
= ; points/strategies.
= ; = The characterization appears
= ; adequate.
= ; 4. Did the TZW data contain any surprises = which
= ; will result in additional upland groundwater

= ; characterization?
= ; = Section 5.3.1 points out two VOCs in
= ; TZW that exceed screening levels, TCE and 1,2-DCA,
= neither of which are upland COIs. I do not believe
= ; these VOCs are migrating from the subject site and do
= ; not plan additional investigation into this.
= ; 5. Do you agree/disagree with the = LWG
= ; assessment/conclusions relative to TZW adjacent to
= ; your site?
= ; = I agree with their conclusions, but
= ; have the following comments:

= ; = Section 5.1 = The
= ; = table summarizing upland groundwater consists
= ; = solely of grab samples. I'm surprised they = did
= ; = not rely more on data from monitoring wells.
= ; There are seven multi-channel tubing = monitoring
= ; = wells along the site's shoreline (CMT1-7) that
= ; = allow groundwater sampling at various depths and
= ; = an off-site monitoring well to the north
= ; = (LPMW-01), and we have four quarters of data
= ; = from 2005; this data set appears more
= ; = appropriate to use in comparison to TZW data
= ; = than what the LWG presented. This upland
= ; = multi-depth groundwater data should be used in
= ; = the LWG cross sections (Figures 5-5b-i) to
= ; = interpret contaminant migration to TZW sampling
= ; = points, as well as recent nearshore and

= ; = revetment lithology and contaminant
 = ; = characterization data.

= ; = The last paragraph of this section describes how
 = ; = the current seawall and hydraulic controls are
 = ; = mostly, but not completely effective in
 = ; = providing source control. The text should
 = ; = recognize that most of these concerns, including
 = a “detached” plume east of the seawall, will =
 be

= ; = addressed next year when Arco constructs a
 = ; = deeper, replacement sheetpile barrier wall and
 = ; = removes contaminated sediment to the east.

= ; = Section 5.3.1 TCE and 1,2-DCA are not = upland
 = ; = site COIs and their detection in TZW samples is
 = ; = not believed to be related to the upland site.

= ; = Section 5.3.3 Using the more = appropriate
 = ; = upland groundwater data described in the comment
 = ; = on Section 5.1, their statement that “TPH-D
 = ; = concentrations observed in TZW samples are all
 = ; = higher than those observed in the upland
 = ; = nearshore groundwater” is incorrect. For
 = ; = example, TPH-D ranged from 0.34 to 3.6 mg/L in
 = ; = TZW and up to 7.4 mg/l in upland nearshore wells
 = ; = (2005 data from CMT wells). The statement that
 = ; = these patterns are similar to those observed at

= ; = the ExxonMobil site is also incorrect (see
 = ; = ExxonMobil comment on Section 6.5).
 = ; = This significant decrease in TPH concentrations
 = ; = moving from upland nearshore wells to TZW sample
 = ; = locations may be indicative of the effectiveness
 = of the existing seawall and hydraulic
 = ; = containment source control measures; Arco plans
 = ; = additional upland and nearshore source control
 = ; = measures and investigation on their
 = ; = effectiveness in preventing contaminant
 = ; = migration to the river.

ExxonMobil

= ; 1. Is the area of apparent groundwater = discharge
 = ; and transition zone groundwater (TZW) data consistent
 = ; with the upland conceptual hydrogeologic model?
 = ; = Yes.
 = ; 2. Do you think additional sampling is = necessary
 = ; to obtain representative TZW data to conduct a TZW
 = ; risk assessment representative of the groundwater
 = ; pathway from upland sources?
 = ; = No.
 = ; 3. Is the characterization of TZW adequate = or are
 = ; the data gaps (e.g., nature and extent)? = If so please
 = ; elaborate and propose recommended sampling
 = ; points/strategies.
 = ; = The characterization appears

= ; adequate.

= 4= . Did the TZW data contain any surprises which

= ; will result in additional upland groundwater

= ; characterization?

= ; = Not really, but see comment on

= ; Section 6.5.

= ; 5. Do you agree/disagree with the = LWG

= ; assessment/conclusions relative to TZW adjacent to

= ; your site?

= ; = I generally agree with their

= ; conclusions, but have the following comments:

= ; = Section 6.1 The upland groundwater = quality

= ; = table uses data from 2003, yet there is more

= ; = recent data from 2005-2006 which should be used.

19 = &= nbsp; Also, the groundwater monitoring wells KMW01-

= ; = are not "shoreline" wells, and the = recently

= ; = installed wells KMW29-30 and 36-37 (located in

= ; = the barrier wall gap, each with six quarters of

= ; = data) appear to be more representative of

= ; = groundwater migrating from the site to the

= ; = Willamette River. This also affects the

= ; = presentation in Figure 6-5a.

= ; = Section 6.5 Perhaps because of the = upland

= ; = groundwater data set they chose to use (see

= ; = comment on Section 6.1), their statement that

= ; = "TPH-G and TPH-D concentrations are
= ; = substantially higher in the TZW than in the
= ; = nearshore upland groundwater" is incorrect. = The
= ; = opposite is true: for example, TPH-D ranged
= ; = from 0.35 to = 3.6 mg/L in TZW and up to 14.8 mg/l
= ; = in upland nearshore wells (5/06 data from
= ; = KMW29-30 and 36-37). While this significant
= ; = decrease in TPH concentrations moving from
= ; = upland nearshore wells to TZW sample locations
= ; = is welcome, the magnitude of decrease in the
= ; = approximately 100 lateral feet between the two
= ; = sampling locations is somewhat unexpected.

Note that DEQ is pressing = ExxonMobil to enhance the source control measures in the downstream = portion of their site (area between the slurry wall and the Arco = facility), based on high diesel and As detections in upland riverbank wells. The LWG TZW data suggests that the plume rapidly = attenuates. This is an area that we may want additional in-water testing = to confirm the initial results. It is also something that = ExxonMobil may propose to conduct in lieu of additional source control measures. Matt

Thanks-

Tom Gainer, = P.E.

Project Manager/Environmental = Engineer

Oregon Department of = Environmental Quality, NW Region

SLLI (Rhone Poulenc)

= ; 1. Is the area of apparent groundwater = discharge and
= ; transition zone groundwater (TZW) data consistent with the
= ; upland conceptual hydrogeologic model?
= ; Yes, where we have data near the riverbank. The = discharge
= ; zone at RP-03 may represent a "worst case," but = the
= ; evaluation does not fully address whether the deep
= ; alluvium/basalt groundwater also discharges further out in
= ; the river channel and further downstream. It would have
= ; helped if either the upland cross sections (9-5b through
= ; 9-5e) which show stratigraphy were extended out into = the
= ; river or the in-water cross sections (9-6a through 9-6f) TZW
= ; profiles showed the stratigraphy, and to add a figure that
= ; shows the complete river profile from bank to bank. = This
= ; would better illustrate whether the upland alluvial gravels
= ; are associated with the sandy discharge zone at RP-03 and
= ; whether or not "the basalt does not outcrop in the river" = as
= ; indicated on page 68 (it comes within 6 feet of the
= ; riverbottom based on City CSO borings). The text does not
= ; indicate whether the alluvial gravels outcrop in the river.

= ; 2. Do you think additional sampling is = necessary to
= ; obtain representative TZW data to conduct a TZW risk
= ; assessment representative of the groundwater pathway from

= ; upland sources?

= ; No. Although the data set is limited, the = sampling

= ; conducted does appear to be representative.

= ; 3. Is the characterization of TZW adequate = or are the

= ; data gaps (e.g., nature and extent)? If so please = elaborate

= ; and propose recommended sampling points/strategies.

= ; Generally it is adequate. A first next step would be = to

= ; include the TZW data to the north at Siltronic and to the

= south at Arkema in the evaluation, given the breadth of the

= ; upland Rhone Poulenc groundwater plume. Also, as noted

= ; above, consider looking further out in the river channel.

= ; 4. Did the TZW data contain any surprises = which will

= ; result in additional upland groundwater characterization?

= ; Yes. The identification of two relatively = discrete

= ; discharge zones, particularly the sandy zone north of the

= ; railroad bridge, will help focus additional groundwater

= ; characterization upland. The sandy zone north of the

= ; railroad bridge is consistent with a "trough" in the = surface

= ; of the basalt acting as a preferential groundwater flow

= ; pathway. SLLI (Rhone Poulenc) and their consultant AMEC

= ; have already proposed an update to the site conceptual =
model

= ; and are using the information to locate wells and propose

= ; interim source control measures.

= ; 5. Do you agree/disagree with the = LWG

= ; assessment/conclusions relative to TZW adjacent to your
= ; site?
= ; Generally, yes.

Tom Roick

SLLI (Rhône Poulenc)

I have reviewed the section of the LWG summary = report for groundwater

sampling. The following are my comments with = respect to the questions posed.

1. TZW data consistent with RPAC model? I would = have to say it appears strongly linked. However, RPAC is focusing = on the gravel zone above the bedrock as the main transport pathway and = there should be a better depiction of the connectivity of the gravel = with the sandy discharge area and the near shore discharge area. = The near shore discharge area seems like it is too shallow for the = main transport pathway for RPAC. I also agree that the cross = sections should be extended farther out into the river. I also think = that the A-A' and B-B' cross sections should be coordinated a little = better with the main RPAC cross section (they are not even shown on = the same map to get a sense of orientation and scale for the river portions).

2. Additional sampling for risk assessment? It is a = small data set.

It would be consistent with screening using maximum concentrations.

3. Is TZW characterization adequate? A better interpretation and presentation of existing information would be a = good next step.

Sounds like RPAC is going to do that at least for = the upland information. Do we know if they would intend to = incorporate the LWG data into a revision of the site = model?

4. Did the TZW data contain surprises? No and yes. = We knew that the "plume" had to go somewhere so this = verifies the anticipated discharge. I was surprised by the levels of some = dissolved metals and don't know off hand how they compare to the upland concentrations; manganese is one that seems really = high.

5. Agree/disagree with the LWG assessment? Yes and = I look forward to

any better coordination between the RPAC upland and = LWG data and depictions.

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